Understanding the Fire Program Analysis (FPA) Prevention Program

Topic

Understanding the Fire Program Analysis Prevention (FPA PV) Module.

Introduction

Fire Planners use the FPA Prevention Program (FPA PP) to simulate changes in the number of human-caused fires resulting from increasing or decreasing investments in prevention activities.

Background

It has been FPA's policy to adopt existing fire behavior models, rather than attempt to duplicate or redesign existing solutions in the fire community. FPA's Prevention Program adopted the core assumptions and effectiveness factors used by the Risk Assessment and Mitigation Strategies (RAMS) model. FPA users are not required to be familiar with the RAMS application.

The FPA Prevention Program Module is a server-based application incorporating Prevention, and Communities functionality. FPA PP will:

- Model the expected changes in the number of human caused fires, resulting from increasing or decreasing prevention activities.
- Allow planners to develop several different prevention programs with their associated costs, and compare results.
- Significantly reduce the fire planner's workload by only requiring inputs for general actions that affect the entire Fire Planning Unit (FPU) and specific actions at the prevention activity category level for the Fire Management Group (FMG).

Terms

Statistical Cause: Assigned to every wildland fire and is entered on a fire report by the responsible land management agency. Statistical causes are: Lightning, Equipment Use, Smoking, Campfire, Debris Burning, Railroad, Arson, Children, and Miscellaneous.

General Actions: Prevention actions that have an effect over the entire FPU. They include fair booths, public education programs, advertising, parade participation, and other activities that could reach an entire FPU audience. General action hours act as a multiplier to the specific action hours invested in each prevention program.

Specific Actions: Prevention actions that affect one or more Fire Management Groups (FMGs), but not the entire Fire Planning Unit (FPU). Specific actions include patrol, signs, law enforcement, hazards, public contact, inspections, administration, and communities.

Community Actions: Prevention actions designed to reduce human-caused fires for one or more communities. Community actions use effectiveness factors to assess how inspections and public contact activities affect the rate of human-caused fires.

Category Level: A level of prevention activity that includes patrol, signs, law enforcement, hazards, public contact, inspections, administration, and communities. The FPU Planner assigns the number of hours for each specific prevention action that affects one or more FMGs to one of these categories.

Discussion

Preventability Factors (pf):

FPA PV uses preventability factors (shown in Table 1) to assess the preventability of fires by statistical cause. FPA PV sets the value of preventability factors (pf) and does not allow these values to be exceeded. The number of hours in each activity, (for example, law enforcement, patrol, and signing), combined with the effectiveness factors in Table 2 determine the pf. The resulting pf is at or below the set pf values in Table 1.

Statistical Cause	pf
Lightning	0
Equipment Use	0.15675
Smoking	0.1395
Campfire	0.17375
Debris Burning	0.16125
Railroad	0.14125
Arson	0.07

Statistical Cause	pf
Children	0.16125
Miscellaneous	0.0995

Table 1: FPA PV Preventability Factors for Human-Caused Fires

Effectiveness Factors

FPA PV uses effectiveness factors to indicate how effective various prevention activities are at preventing fires of specific causes. For example, in Table 2, law enforcement is more than twice as effective as signing in the prevention of arson fires. The number of hours in each prevention activity has an effect on the level of effectiveness.

Prevention Activity	Arson	Campfire	Children	Debris	Equip	Misc	RR	Smoking
Patrol	0.4	0.6	0.4	0.6	0.4	0.3	0.3	0.4
Signs	0.2	0.5	0.3	0.4	0.3	0.3	0.1	0.4
Law Enforcement	0.5	0.7	0.4	0.6	0.6	0.3	0.5	0.5
Hazards	0.2	0.4	0.2	0.4	0.6	0.2	0.6	0.2
Public Contact	0.3	0.7	0.65	0.6	0.55	0.4	0.35	0.45
Inspections	0.2	0.6	0.35	0.55	0.6	0.3	0.45	0.35
Administration	0.2	0.4	0.3	0.4	0.4	0.2	0.2	0.3
Communities	0.2	0.4	0.3	0.4	0.4	0.3	0.3	0.35

Table 2: FPA PV Preventability Factors for Human-Caused Fires

Preparedness Option

A prevention program, combined with an initial response organization, creates a preparedness option. FPA PP passes the proportion of prevented fires that result from the modeled prevention program to the FPA Fire Event Scenario (FES). FPA PP also models how many more human-caused fires would occur if prevention activities decreased from historic funding levels.

Those human-caused fires where prevention actions were modeled to be effective (fires prevented) are tagged for use in calculating the FPA performance measure for initial attack success rate. The tagged fires are not included when Initial Response Simulation (IRS) models the Initial Response Organization portion of the Preparedness Option being analyzed (see Figure 1.)

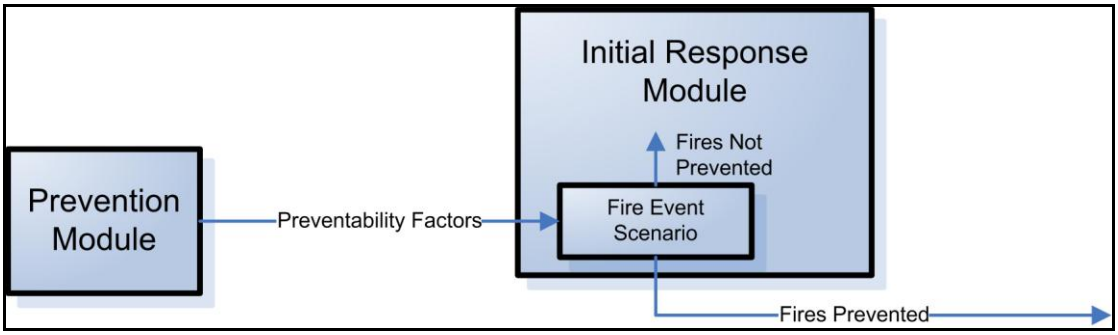

Figure 1: FPA Prevention Program Impact on Fires Modeled

FPA reports the resulting increase or decrease in the number of human-caused fires along with the number of fires contained in the IRS.